

C L A I M S

1. A monitor photodetector-equipped optical modulator characterized by comprising:

an optical modulator having a substrate, an
5 optical waveguide, a center electrode, and at least one ground electrode, the substrate having electro-optic effect, the optical waveguide which guides a light beam being formed on one surface side of the substrate, the center electrode and the at least one ground electrode
10 being applied therebetween voltage for modulating the light beam guided by the optical waveguide, the optical waveguide including an input optical waveguide, two branching optical waveguides, two interaction optical waveguides, a multiplexing optical waveguide, and an
15 output optical waveguide, the light beam being incident on the optical waveguide through the input optical waveguide, the two branching optical waveguides guiding the light beam incident on the input optical waveguide while branching the light beam into two light beams,
20 the two interaction optical waveguides modulating each phase of the two light beams by applying the voltage between the center electrode and the at least one ground electrode, the multiplexing optical waveguide multiplexing the two light beams which propagate
25 through the two interaction optical waveguides, the output optical waveguide being connected to the multiplexing optical waveguide through a multiplexing

point of the multiplexing optical waveguide which multiplexes the two light beams, a high-order mode light beam which is generated by multiplexing phase-modulated two light beams in the multiplexing optical waveguide being radiated from the multiplexing point to an inside of the substrate as two radiant light beams while the high-order mode light beam hardly propagates through the output optical waveguide in the optical modulator; and

10 a monitor photodetector which detects at least one of the two radiant light beams radiated from the multiplexing point to the inside of the substrate of the optical modulator,

15 the optical modulator characterized in that the output optical waveguide is formed while deformed in order to secure a space for mounting the monitor photodetector such that at least one of optical axes of the radiant light beams in a substrate facet located on the output optical waveguide of the substrate and an edge portion of the output optical waveguide are separated from each other by a predetermined distance.

2. A monitor photodetector-equipped optical modulator according to claim 1, characterized in that the output optical waveguide is formed while a position of the multiplexing point in a direction orthogonal to a longitudinal direction of the substrate differs from a position of the edge portion of the output optical

waveguide.

3. A monitor photodetector-equipped optical modulator according to claim 1, characterized in that the output optical waveguide is a Mach-Zehnder type optical waveguide.

5 4. A monitor photodetector-equipped optical modulator according to claim 1, characterized in that the monitor photodetector is provided near the substrate facet.

10 5. A monitor photodetector-equipped optical modulator according to claim 4, characterized in that the monitor photodetector is provided through a room.

15 6. A monitor photodetector-equipped optical modulator according to claim 1, characterized by further comprising a mirror which is fixed near the substrate facet, wherein, after at least one of the two radiant light beams is emitted from the substrate, an optical path is changed by the mirror and the radiant light beam is adapted to be incident on the monitor photodetector.

20 7. A monitor photodetector-equipped optical modulator according to claim 1, characterized by further comprising a capillary which is fixed near the substrate facet, wherein, after at least one of the two radiant light beams is emitted through the capillary, the radiant light beam is adapted to be incident on the monitor photodetector.

8. A monitor photodetector-equipped optical modulator according to claim 1, characterized by further comprising an optical power attenuation mechanism which is provided between the multiplexing point and the substrate facet on the output optical waveguide side of the substrate such that one of the two radiant light beams radiated from the multiplexing point of the multiplexing optical waveguide is attenuated while the radiant light beam propagates toward the substrate facet.

10 9. A monitor photodetector-equipped optical modulator according to claim 1, characterized in that the monitor photodetector is formed by a photodiode.

15 10. A monitor photodetector-equipped optical modulator according to claim 7, characterized in that a facet to the substrate facet side of the capillary is substantially parallel to a facet to the side in which one of the two radiant light beams is emitted in the capillary.

20 11. A monitor photodetector-equipped optical modulator according to claim 7, characterized in that a region, where the facets are not parallel to each other, exists between the facet to the substrate facet side of the capillary and at least a part of the facet on the side in which one of the two radiant light beams is emitted, of the capillary.